![PELCO]

Sarix Enhanced 3
Dome, Bullet, and Box Cameras
Operations Manual

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Important Notices

Regulatory Notices

This device complies with Part 15 of the *FCC Rules.* Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Radio and Television Interference

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission's rules.

CAN ICES-3 (A)/NMB-3(A)

Warranty Statement

For information about Pelco's product warranty and thereto related information, refer to www.pelco.com/warranty.

Legal Notice

SOME PELCO EQUIPMENT CONTAINS, AND THE SOFTWARE ENABLES, AUDIO/VISUAL AND RECORDING CAPABILITIES, THE IMPROPER USE OF WHICH MAY SUBJECT YOU TO CIVIL AND CRIMINAL PENALTIES. APPLICABLE LAWS REGARDING THE USE OF SUCH CAPABILITIES VARY BETWEEN JURISDICTIONS AND MAY REQUIRE, AMONG OTHER THINGS, EXPRESS WRITTEN CONSENT FROM RECORDED SUBJECTS. YOU ARE SOLELY RESPONSIBLE FOR INSURING STRICT COMPLIANCE WITH SUCH LAWS AND FOR STRICT ADHERENCE TO ANY/ALL RIGHTS OF PRIVACY AND PERSONALTY. USE OF THIS EQUIPMENT AND/OR SOFTWARE FOR ILLEGAL SURVEILLANCE OR MONITORING SHALL BE DEEMED UNAUTHORIZED USE IN VIOLATION OF THE END USER SOFTWARE AGREEMENT AND RESULT IN THE IMMEDIATE TERMINATION OF YOUR LICENSE RIGHTS THEREUNDER.

Audio Notice

Improper use of audio/visual recording equipment may subject you to civil and criminal penalties. Applicable laws regarding the use of such capabilities vary between jurisdictions and may require, among other things, express written consent from the recorded subjects. You are solely responsible for insuring strict compliance with such laws and for strict adherence to any/all rights of privacy and personality.

Video Quality Caution

Frame Rate Notice Regarding User Selected Options

Pelco systems are capable of providing high quality video for both live viewing and playback. However, the systems can be used in lower quality modes, which can degrade picture quality, to allow for a slower rate of data transfer and to reduce the amount of video data stored. The picture quality can be degraded by either

lowering the resolution, reducing the picture rate, or both. A picture degraded by having a reduced resolution may result in an image that is less clear or even indiscernible. A picture degraded by reducing the picture rate has fewer frames per second, which can result in images that appear to jump or move more quickly than normal during playback. Lower frame rates may result in a key event not being recorded by the system. Judgment as to the suitability of the products for users' purposes is solely the users' responsibility. Users shall determine the suitability of the products for their own intended application, picture rate and picture quality. In the event users intend to use the video for evidentiary purposes in a judicial proceeding or otherwise, users should consult with their attorney regarding any particular requirements for such use.

Open Source Software

This product includes certain open source or other software originated from third parties that is subject to the GNU General Public License (GPL), GNU Library/Lesser General Public License (LGPL) and different and/or additional copyright licenses, disclaimers, and notices. The exact terms of GPL, LGPL, and some other licenses are provided to you with this product. Please refer to the exact terms of the GPL and LGPL at http://www.fsf.org (Free Software Foundation) or http://www.opensource.org (Open Source Initiative) regarding your rights under said license. You may obtain a complete corresponding machine-readable copy of the source code of such software under the GPL or LGPL by sending your request to digitalsupport@pelco.com; the subject line should read Source Code Request. You will then receive an email with a link for you to download the source code. This offer is valid for a period of three (3) years from the date of the distribution of this product by Pelco.

Power Source

This product is intended to be supplied by a Listed Power Adapter or DC power source marked "L.P.S." (or "Limited Power Source"), rated according to the camera specification document. If you need further assistance with purchasing the power source, please contact Pelco, Inc. for further information.

Korean Class A EMC

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시길 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

ESD Warning

Warning: This product is sensitive to Electrostatic Discharge (ESD). To avoid ESD damage to this product, use ESD safe practices during installation. Before touching, adjusting or handling this product, correctly attach an ESD wrist strap to your wrist and appropriately discharge your body and tools. For more information about ESD control and safe handling practices of electronics, please refer to ANSI/ESD S20.20-1999 or contact the Electrostatic Discharge Association (www.esda.org).

Locating Updates and Other Resources

- Before installing the camera, visit the online Pelco supplemental resources to check for firmware updates.

- All resources are available in one location: https://www.pelco.com/fixed-ip-sarix-enhanced-series. From this location, select the asset(s) you want to download.

    – Sarix Enhanced Series Firmware—Download the latest firmware for your Sarix Enhanced Series camera system.

    – Sarix Enhanced Series Documentation—Download the latest specification sheets as well as installation and operations manuals for the Sarix Enhanced Series.

    – VxToolbox—Download the latest firmware for the camera management utility. This software helps you discover the camera and update firmware.

Accessing the Camera

Note: For security purposes, it is required that you create a user account when you access the camera for the first time.In its out-of-the-box configuration, the camera has no user name and password assigned. In this state the camera does not allow for video to stream or configurations to change. It is required that you set an administrative user name and password at this time. Creation of an administrative user changes the state of the camera to its "operational mode," where credentials must be provided in order to view live video or change its configuration. This first user configuration can also be done in VxToolbox software.

There is no provision for recovering a forgotten administrator user name or password. The camera can be restored to its out-of-the-box, no user name and password configuration by powering down, depressing the Factory Defaults button, and holding the button down for at least four seconds while powering the camera back up.

Once the camera is powered back up the user will be prompted to create a username and password.

The recommended browsers for your camera are Mozilla® Firefox®, Google Chrome™, or Microsoft™Edge™ for Microsoft® Windows® operating systems; and Firefox for Mac® operating systems. For supported browser versions, refer to the Specification Sheet for your product.

1. Open a web browser.

2. Type the camera's IP address or host name in your browser's address bar and then select Enter.

    Note: You can obtain your camera's IP address or access the camera using VXToolbox software.

3. If a user name and password exist, a log in dialog box appears. Otherwise a user creation dialog box appears, and the user will be required to create an administrative user to proceed.

Accessing Camera Settings

Access to camera settings is determined by user permissions. If you do not have access to camera settings, the Settings option will not appear in the top-center of the Live View window.

1. Select the gear symbol at the top center of the viewing window.

2. Select the setting you want to change. Place your mouse pointer over any menu on the page to reveal submenus.

Understanding the Camera Configuration Sequence

After the camera is installed and power is applied, the camera undergoes a configuration sequence, taking approximately 30-seconds to complete. The camera will come online after the configuration sequence is complete.

Note: If the camera connected to a network without a DHCP server and DHCP is enabled, the configuration sequence can take up to two minutes to complete.

Accessing the Live View
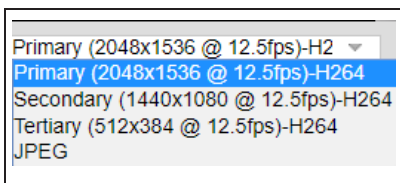
The live video page provides access to video streams and, where applicable, to PTZ controls.

By default, the camera does not have any pre-configured users. When a user is added to the system, that user must login before accessing the *Live View*. After logging in, the user will have access to the *Live View* from that point forward.

Selecting Live View Controls

Viewable controls are based on device model and user permissions. Use the drop-down menu to select the Primary, Secondary, and Tertiary streams from the live view. The JPEG Stream is a predefined low resolution, low frame rate JPEG stream. JPEG is helpful for users with bandwidth or processing limitations that could cause a high resolution, high frame rate video stream to pause or pixelate.

⚠️ **Caution**: Streams must be configured to use the H264 compression standard. Streams with any other compression standard will not be available for selection. If the If the secondary or tertiary stream has not been configured, they will not be available for selection. Video streams can be configured under the A/V Streams Menu.

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Primary (2048x1536 @ 12.5fps)-H2 ▾ **Primary (2048x1536 @ 12.5fps)-H264** Secondary (1440x1080 @ 12.5fps)-H264 Tertiary (512x384 @ 12.5fps)-H264 JPEG	Select Stream: Use the pull-down menu located on the bottom left of the window to select stream while in the live view.
⤢	Open Stream in New Window: Opens the video stream in an independent window.
📷	Take a Snapshot: Captures a still image from the video stream and saves it as a JPEG file.
▨	Enables tool on the viewer to calculate pixels in the area of the adjustable box.

Using Zoom and Focus Controls

Sarix Enhanced Series cameras feature zoom and focus controls on the Live View window and in the Settings.

- **Zoom**: Use slider bar to increase magnification from 0-100
- **Auto-Focus**: Select to find the optimal focal point for the scene.

📝 **Note:** Focus Settings affect your camera's focusing behaviors. If you set all focus behavior settings to Off, you must manually focus your camera. If your camera appears out of focus and an **Auto-Focus** does not resolve the issue, then you may need to reset the lens' default position. Go to **Imaging**>**Focus/Zoom** and select **Initialize Lens**.

Using the System Menu

The System menu provides access to the **General Settings**, **Backup and Restore**, **Firmware**, **OSDi**, **Snapshot Viewer**, **Storage Management**, and **Diagnostics** pages.

Selecting General Settings

Go to **System** > **General (camera) Settings** to configure General Settings, Time Settings, and GPS settings as well as Generate a System Log, Reboot a Camera, and Restore All Camera Defaults.

Configuring General Settings

Go to System > General Settings to enter a Device Name, Enable LEDs, set Time Settings, enter GPS Settings, Generate System Log, Reboot Camera, and Restore All Camera Defaults.

1. Go to **System** > **General Settings**.
2. Configure the name for your device. Names can contain up to 63 alphanumeric characters. At least one character in the host name must be a letter.
3. Enable LEDs by selecting the On button. By default, LEDs will be *Off*.
4. Select Save.

Configuring Time Settings

You can set your camera to discover a network time server (NTP) automatically, manually provide the address of your network time server, or select no time server.

1. Go to **System** > **General Settings**.
2. Select your time server setting:

   - **Auto:** Allows your camera to discover and synchronize with your network time server (over IPv4 or IPv6).
   - **Manual:** Requires you to provide the address of your network time server.
   - **None:** Camera date format defaults to mm/dd/1970.

3. Select the *Time Zone*.
4. Select **Save**.

Configuring GPS Settings

GPS information can be added to the recorded video.

1. Go to **System** > **General Settings**.
2. Manually enter the *Latitude*, *Longitude*, and *Elevation* of the camera.
3. Select **Save**.

Generating a System Log

If technical difficulties occur, a system log can help Pelco Product Support troubleshoot problems with your camera. You can contact Pelco Product Support at 1-800-289-9100 (USA and Canada) or +1-559-292-1981 (international).

1. Go to **System** > **General Settings**.
2. Select Generate System Log.

3. Select the location in which to save the log file.
4. Select **Save**.

Rebooting a Camera

If you are recording video from your camera, restarting the camera will cause a gap in video recording. It is important that you schedule maintenance before restarting the camera.

To restart the camera, select Reboot Camera.

Restoring All Camera Defaults

If necessary, you can reset your camera settings to the factory defaults.

1. Go to **System** > **General Settings**.
2. Select Restore All Camera Defaults.
3. Select **Hard** or **Soft** Restore.

   - **Soft Restore** will reset the camera back to factory defaults with the exception of network settings. All user settings and customizations will be lost and cannot be recovered.

   - **Hard Restore** will reset the camera back to factory defaults. All user settings and customizations and network settings will be lost and cannot be recovered.

4. Select **Upload and Restore** to restart and restore you camera's settings.

Backing Up and Restoring Settings

You can create a backup file of your device's configuration so that if you accidentally change a setting or need to recover from a factory reset, you can revert back to this saved configuration. Camera backup files are stored in bin format.

Note: The restore feature is not intended to automatically configure multiple devices or to recover settings following a firmware upgrade.

Back Up Camera Settings

1. Got to **System** > **Backup and Restore**.
2. Select Generate Backup File.
3. Select Download Now, and then specify the directory in which to save your backup file.

Restore Camera Settings from a Backup

1. Go to **System** > **Backup and Restore**.
2. Select Browse,select the desired backup file, and then select **Open**.
3. Select Upload and Restore; to restart the camera and restore the camera settings.

Updating Firmware

Go to **System** > **Firmware** to access System Information and perform Firmware Updates.

System Information includes read-only fields for the firmware version, hardware version, model number, and serial number of the camera. This information is typically required by Pelco Product Support for troubleshooting purposes.

The camera firmware can be upgraded or downgraded.

1. Select Browse to select the firmware you would like to upgrade/downgrade (ppm file).
2. Select Upload.

> **Note:** Upgrading to version 3.3.x.x firmware requires user(s) to exist on the camera. Otherwise, the firmware update will fail.

Configuring OSDi Overlays

The **OSDi** (Intelligent On Screen Display) feature allows the camera to show pertinent information as an overlay within the field of view. Depending on your camera and model, you may be able to define up to three overlay rules. You can also determine the position of each overlay within the scene.

If using the Current Zone Label overlay, and multiple zones are in the field of view, the camera will display the labels in order of size, smallest to largest; if all zones in the field of view are the same size, the camera will display zone labels in order of creation, oldest to newest. If the *Duration* field is set to 0 seconds, the overlay will only display the first zone label using the rules above until the zone is no longer in the field of view.

1. Go to **System** > **OSDi** to configure Intelligent On Screen Displays.
2. In the viewing window, select select the position in which you want to place an overlay (Upper Left, Upper Center, Upper Right, Middle Left, Middle Center, Middle Right, Lower Left, Lower Center, Lower Right).
3. Select the type of Overlay to display: Plain Text, Camera Name, Camera Name/Date/Time, Date/Time, Date, Time, Event Source, or Image.

   > **Note:** If Image is selected, you will need to upload a valid file type by selecting Browse and then selecting the file. For Event Source, you will need to manage the handlers and sources in the Events Menu.

4. The format field is automatically populated for Camera Name, Date and Time based on the setup of the Time Settings (System > General Settings > Time Settings). You will need to select the format for the display for date and time. If you have selected Plain Text, you will need to enter the text to be displayed.
5. Set the font size for the overlay.
6. (Optional) Select the Font Color and Background Color.
7. Select **Save**.

Using the Snapshot Viewer

1. Go to **System** > **Snapshot Viewer** to display a list of snapshots and clips saved to the SD card when a "Write JPEG to SD Card" or "Write Recording to SD Card" event handler(s) are configured. From this page, you can open, download, or delete snapshots and clips from the SD card. Viewing options include: Select Visible, Deselect Visible, Select All, Deselect All, Delete Selected, Download Selected, Refresh List.

   > **Note**: Snapshot Viewer is not available when recording video to local storage. An SD card must be inserted and configured under Event Handlers.

2. Select the number of files to show per page. The default setting is 15, however up to 100 snapshots can be displayed on this page.

Configuring Storage Management

Go to **System** >**Storage Management** to access and/or manage Device Information, Settings and Actions, Local Recording, and Export Recordings.

Note: For choosing SD cards, it is important to pick SD cards suited to surveillance video recording for use in Pelco cameras. These are available from reputable brands and are purposely designed to be used for the challenges of surveillance where high resolution, high frame rate video is recorded 24/7, often in elevated temperature conditions. The SD cards aimed at this application are designed to support the high write and read speeds video surveillance demands, have adequate write cyclability, and can withstand internal temperatures in the camera when placed in harsh environments.

Look for SD cards designed for industrial video surveillance applications with high MTTF (Mean Time to Failure) and good warranties with operating temperature ratings in excess of 80°C (176°F). For Cameras with resolutions up to 5 MP use cards with speed ratings of Class 10 UHS I or better. For 4K cameras, use cards with speed ratings of UHS 3 VHS30 or better.

Use a large enough capacity card that rarely needs to be replaced. A 128 GB card in a 2 MP camera recorded continuously at 30 FPS with a typical bit rate of 5 Mb/s under average environmental conditions should last close to 5 years before it needs to be replaced. Using motion recording, Smart Compression, and more advanced encoding schemes like H.265 will increase this substantially. SD cards for video surveillance today are available in capacities up to 1 TB, so you can pick SD cards that last the life of the camera.

Viewing Device Information

Device Information provides information for the SD card. The following information will be displayed when an SD Card is properly installed:

- **Device Type**: SD Card
- **Free Space**: Expressed in MB
- **Total Size**: Expressed in MB
- **Status**: Ready to begin recording

Note: If there is no SD card in the camera or it was not properly installed, the Status will display "There is no media in the SD card."

Using Settings and Actions

- **Device Format**: displays the device format with the option to reformat the device.
- **SD Allocation**: Use the slider bar to establish how much storage to allocate between **Edge** and **Clip** storage.

Configuring Local Recording

The number of hours of video you can store on the micro SD card depends on several factors besides the capacity of the micro SD card.

There is, however, a limit on the total number of frames that can be stored on the micro SD card. For example, below a bit rate of 1.5 Mbps, you can store a maximum of 48 hours of video at 30 fps on a 32 GB card. You can increase the maximum available hours of storage by decreasing the frame rate.

The number of hours of video you can store on the SD card is established with recording bit limits. A bit rate limit below 1.5 Mbps allows a maximum of 48 hours of video at 30 fps regardless of resolution. You can increase the maximum available hours of storage by decreasing the frame rate.

Note: The numbers listed above do not include audio. With audio enabled, the number of hours you can record decreases. The impact is minimal above bit rates of 2.25 Mbps. At bit rates below 2.25 Mbps, the number of hours your can record may drop by approximately 40 percent.

1. Go to **System** > **Storage Management**.
2. Check that the recording state is *Ready*.
3. Check the Record Metadata box if you want metadata included.
4. Select REC.

Exporting Recordings

Export Recording will export video recorded on your SD card to additional formats.

Viewing Diagnostics

Go to **System** > **Diagnostics** to get information on Client Connections and Camera Temperature.

Viewing Client Connections

This box displays the current client connections and the IP address for each connection.

Client Connections displays the number of active streams by Client Address, Stream type, and Duration.

Viewing Temperature Information

A graphic display provides maximum, minimum, average processor temperatures for the current session and historical temperature information.

Using the Network & Security Menu

The *Network & Security* menu contains Network configuration Settings and options for your camera; from this menu, you can set static IP addressing, create User & Security levels, enable TLS, add Traffic Shaping, configure 802.1x port security, point your camera to an SNMP manager, and configure Firewall settings. By default, your camera receives an address over DHCP and all other network features are disabled.

Changing General Network Settings

Go to **Network & Security** > **Network** to configure a *Network Hostname*, *Port Settings*, and *Network Interface*.

Network Hostname

You can configure a hostname for your camera containing up to 63 alphanumeric characters. At least one character in the host name must be a letter.

Port Settings

Port settings determine the ports over which users communicate with the camera.

HTTP: Do not change the HTTP when connecting to a Pelco video management system (VMS); doing so might prevent you from viewing or recording video from your imaging camera. The default HTTP port is 80.

HTTPS: Set SSL to Optional or Required and install a security certificate before altering the HTTPS port. The default HTTPS port is 443.

RTSP: Cameras communicate with video management systems over RTSP. Do not change the RTSP port unless you are sure your VMS does not use the default setting. The default RTSP port is 554.

Link Settings

When using the camera with VideoXpert, use the 100 Mb mode to ensure clients can playback video at high framerates. Link speed information is provided per the hardware address. Auto-Negotiate is the default setting for configuring the camera throughput speed automatically. Selecting 100 Mb ensures the throughput speed to 100 Mb.

IPv4 Settings

By default, cameras are configured to obtain network settings over DHCP. If a DHCP server is not available, the camera defaults to an address of 192.168.0.20 on a 255.255.255 subnet. If 192.168.0.20 is already in use on the network, the camera will increment the address by one until it finds an unused address (for example,192.168.0.21 if 192.168.0.20 is in use).

Set DHCP to Off to configure a static address and manually set the subnet mask, gateway, and DNS Server settings.

IPv6 Settings

(Optional): Your camera supports IPv6 configurations in conjunction with IPv4; the device does not support IPv6-only network deployments. The camera will accept up to sixteen IPv6 addresses, three IPv6 DNS servers, and three IPv6 gateways.

There are two configuration modes for IPv6 address assignment:

- **Auto**: Enables automatic configuration using router advertisement. Additional configuration can be provided over DHCPv6 (if available on your network). Selecting *Auto* still allows you to manually

configure additional address, DNS servers, and gateways.

- **Manual Only**: Provides a link-local address for the device, and it requires you to manually configure all other IPv6 address settings for the camera. Manually specified addresses require a prefix and must be input in the format *prefix/IPv6Address*. The camera will reject addresses that do not contain prefix information.

Note:

— Cameras do not accept multicast, localhost, or undefined IPv6 addresses.

— Manually specified DNS servers are not validated by the camera and supersede automatically discovered DNS servers; verify your DNS addresses before saving IPv6 settings.

— Manually specified gateways must be on the same network as the camera's IPv6 addresses. Behavior for a gateway that is not on the same network as the camera's IPv6 addresses is undefined.

— Some video management systems (VMS), including some Pelco systems, do not support connections to cameras and encoders over IPv6.

Managing Users and Security

To manage user accounts and establish how your camera authenticates users (locally or remotely) go to **Network & Security** > **Users & Security**. This gives you the options for User Management and Security authentication.

User Management

Initially, the camera authentication is closed for viewing and configuring without a user name and password. No user accounts exist in the default factory state. Once the Admin role is created and Local Mode User Management is enabled, your camera will authenticate local user accounts.

User permissions are governed by the role assigned to a user. When authenticating users locally, you will assign a role to each individual user. When authenticating users remotely, users will be assigned roles based on their CN and DN assignments.

Your camera supports the following four roles:

- **Admins**: Can access and change all camera settings. They can use all functionality of the camera. They can configure, edit, and delete local user accounts at any time.
- **Managers**: Can access and change all settings, except user permissions. Managers are also unable to restore factory default settings.
- **Operators**: Can view video and have access to the Live View page controls.
- **Viewers**: Can view video.

Configuring Users

1. Go to **Network & Security** > **Users & Security**.
2. Select New User or select the user whose permissions and settings you want to edit.
3. Select an Access Level for the user.
4. Provide a user name between 2 and 32 alphanumeric characters for the user. User names are not case-sensitive and are saved in lowercase characters.
5. Provide a password between 4 and 64 alphanumeric characters for the user. Passwords are case-sensitive.
6. Re-type your password in the appropriate box to confirm your password.
7. Select **Save**.

Setting Security/Authentication

Security settings for the Pelco API and RTSP/JPEG include a choice of Open Authentication or Closed/Require Authentication:

- **Pelco API**: Changes whether credentials are required when accessing the device via the Pelco API. The *Open Authentication* setting leaves your camera open to various intrusions and is not recommended.
- **RTSP/JPEG**: Changes whether credentials are required when streaming video via RTSP or JPEG pull. The *Open Authentication* setting leaves your camera open to various intrusions and is not recommended.

A user must be created before the security settings can be changed.

Configuring TLS

Go to **Network & Security** > **TLS** to configure TLS.

Set TLS to either disabled, optional, or required. You must install or generate a certificate before enabling HTTPS.

The TLS settings include TLS configuration modes and certificate generation. The camera can generate a certificate signing request (CSR) that can be sent to a certificate authority for a signature (for example, VeriSign®), or it can generate a self-signed certificate using the *Generate Self-Signed Certificate* option.

- **Disabled**: Disables HTTPS communications with the device.
- **Optional**: Requires that you install a signed TLS certificate and enables HTTPS access to the device; however, the device will still be available over HTTP.
- **Required**: Requires that you install a signed TLS certificate and enables HTTPS access to the device.

To apply certificate information, select the desired certificate install method and enter the certificate information in the provided form.

- Select **Generate Self-signed Certificate** or **Generate Certificate Request** to open a form including all fields necessary for generating the associated certificate.
- Select **Upload Certificate** to select and upload a certificate.

Configuring Traffic Shaping

Your camera can produce large I-frames, resulting in a traffic burst within each group of pictures as the camera transmits the frame; if your network infrastructure does not have the speed or buffering capacity to smooth out the traffic, you might experience slow or jittery video. Use this function if the frame rate at your client is significantly lower than you would expect from the camera.

1. Go to **Network & Security** > **Traffic Shaping**.

1. Enable **Traffic Shaping** with or without bursts, depending on your need.

    - **Disabled:** Camera will send data at full network hardware link speed (For example: 100 Mbps or 1 Gbps).
    - **Enabled:** Camera will limit the rate at which it sends data. In this setting, the "averaging period" (the period over which the rate limit is valid) is 1 ms. The rate limit for this setting is 12.5 Mbps < R < 100 Mbps.
    - **Enabled with Bursts:** This advanced setting allows you to specify the maximum burst size that the camera can send at the hardware link speed. This balances video latency with the transmission rate.

2. Set the average transmission rate over a 1 ms period over Mbps when enabled without bursts or a 2 ms period in Mbps when enabled with bursts.

3. If you enabled traffic shaping with bursts, set the maximum size of bursts coming from the camera in kilobytes.

4. Select **Save**.

Configuring 802.1x Security

By default, 802.1x security is off. Cameras support EAP-MD5, EAP-TLS, EAP-TTLS, and EAP-PEAP protocols.

1. Go to **Network & Security** > **802.1x**.

2. Select the (EAP) method from the *Protocol* drop-down menu.

3. Provide the authentication information for the EAP method you selected.

4. Select **Save.**

Configuring SNMP

Your camera supports No SNMP, SNMP V2c, and V3, and it can be configured to send traps. The MIB file for your camera is available at *www.pelco.com*.

Configuring SNMP V2c

1. Go to **Network & Security** > **SNMP**.
2. Select SNMP V2c.
3. Provide the community string for your SNMP manager. The default community string is "public."
4. Provide the *Read/Write Community String*.
5. Fill in the IP address of the host server.
6. Fill in the *Community String*.
7. Select the network protocol (NTCIP, Kapsch)
8. Select Save.

Configuring SNMP V3

1. Go to **Network & Security** > **SNMP**.
2. Select SNMP V3.
3. Enter the SNMP user name the camera will use to authenticate with the SNMP server.
4. Select the encryption algorithm for authentication from the *Authentication* drop-down . If using MD5 or SHA authentication methods, enter your authentication code in the box provided.
5. Select the privacy protocol setting from the *Privacy* drop-down menu. If using DES or AES protocols, enter your privacy key in the box provided.
6. Enter the host name or IP address of your trap server in the *Address* box under *Trap Configuration*.
7. Select the network protocol (NTCIP, Kapsch).
8. Select **Save**.

Configuring Firewall Settings

1. Go to **Network & Security** > **Firewall**.
2. Select *Off*, *Allow*, or *Deny* from the *Mode* drop-down menu.

   - **Off:** The default setting is Off. Disables Firewall Configuration.
   - **Allow:** Allows all IP addresses entered to view the camera.
   - **Deny:** Denies all IP address entered to view the camera.

3. Type up to 10 IP addresses in CIDR format in the boxes provided. Enter a valid IP address (IPv4 or IPv6). The address field is specified in CIDR format: a.b.c.d/n for network ranges where a.b.c.d or a.b.c.d/32 can be used for an individual address.

   Note: Incorrect configuration of these IP addresses can result in being locked out of the camera. All IP addresses entered will either be allowed or denied. You cannot allow some IP addresses and deny others. To prevent being locked out:

   • **Allow Mode:** Ensure workstation IP address/network does appear.

   • **Deny Mode:** Ensure workstation IP address/network does not appear.

4. Select **Save**.

Using the Imaging Menu

The Imaging menu provides access to configuring and adjusting the General image, Exposure, Focus/Zoom, White Balance, and Window Blanking. Page Specific Default Settings and All Imaging Settings can be restored from any of these pages except Window Blanking.

Go to Imaging > General to configure Image Enhancement and Digital Processing.

Configuring General Imaging Settings

Go to **Imaging** > **General** to configure Image Enhancement and Digital Processing.

Configuring Image Enhancement Settings

3D Noise Reduction and electronic Image Orientation can be configured from Image Enhancement.

- 3D Noise Reduction set to On adjusts for video noise in the scene.
- 3D Noise Reduction set to Off prevents the camera from compensating for video noise
- Select the Orientation (0, 90, 180, 270 degrees) to electronically rotate the video.

Configuring Digital Processing

Digital Processing settings adjust the color and detail of captured video. The availability of settings might change based on your camera model.

Quick Setup: Contains presets for digital processing settings. You can use any of the quick setup modes as starting points for custom settings; changing sharpness, saturation, contrast, or brightness settings automatically engages the Custom mode.

- **Normal:** A baseline setting in which sharpness, saturation, contrast, and brightness are all set to zero.
- **Vivid:** A setting that enhances color quality, lightens whites, and darkens blacks.
- **Custom:** Allows you to set your own, unique image quality settings.

Sharpness: Controls the clarity of detail in the scene. Increasing video sharpness increases video noise.

Saturation: Controls the intensity of colors in the scene.

Contrast: Controls the gradation between the darkest and lightest portions of the scene.

Brightness: Controls the lighting detail of the scene.

Restore Settings to Defaults: Restores the Imaging General page settings to the camera's default settings.

Restore All Imaging Settings: Restores all of the camera's Imaging settings to default imaging settings for that camera.

Configuring Exposure Settings

Go to **Imaging** > **Exposure** to adjust settings that will help ensure that video contains an adequate level of detail and contrast between light and dark values. Exposure, WDR, Electronic Image Stabilization, Flicker Correction, Day/Night Control, and IR Illumination can be configured.

Configuring Exposure (Mode)

Exposure Mode, Maximum Exposure Time and Max Gain govern exposure settings based on *Gain* and Exposure Time controls; engaging this setting prevents you from configuring an automatic day/night mode. You should only engage this mode if lighting in the field of view is not expected to change during operation.

1. Select the Exposure mode to be used; Frame Rate, Low Noise, or Manual.

2. Set the *Max Exposure Time (msec)* that the imaging sensor is exposed to light. Decreasing the maximum exposure time reduces motion blurring; increasing the maximum exposure time could help capture more detailed still images in low light.

3. Set the *Max Gain*, depending on the exposure mode you selected. Increasing the gain allows for better sensitivity in low-light scenes, but also increases video noise.

4. In Manual- You can also adjust the Iris by changing how much it is opened or closed by positioning the slider bar.

> **Note:** The manual exposure mode disables *Flicker Correction*.

Configuring WDR

WDR can be turned *Off*, set to *Normal*, or set to *High*. *Normal WDR* or *High WDR* is enabled based upon the maximum framerate.

> **Note**: Enabling *High WDR* is only recommended for scenes needing greater than 120dB dynamic range. You will see increase noise artifacts in the midtones at elevated temperatures.

1. Select Change Settings. This will take you to **A/V Streams** > Video Configuration page where *Maximum Frame Rate* and *Aspect Ratio* settings can be configured.

Setting Electronic Image Stabilization

1. Select **On** to enable *Electronic Image Stabilization* to compensate for vibrations that interfere with your camera's video output.

Correcting Flickering

1. Flickering by fluorescent light can be reduced by selecting Auto.

2. Select the appropriate Frequency Hint, None, 50Hz, or 60Hz, depending on the frequency of the light source.

Selecting Day or Night Mode

The *Day/Night* mode controls the IR cut filter, determining whether or not your camera captures color (day) or black and white (night) video. You can set the *Day/Night* position manually, but it is recommended that you engage the auto mode if lighting around your imaging device is expected to change drastically at any time.

1. Select the *Day/Night Mode*.

   - **Auto**: Engages day or night mode based on the Transition Level setting. This allows you to capture color video (Day) when enough light is available, and automatically switch to black and white video (Night) when light is unavailable.

   - **Manual**: Requires you to choose a Day or Night mode. Day captures color video; Night captures grayscale video.

2. (Optional) Set your camera's Transition Level, determining when the camera switches from Day to Night mode. Lighter settings cause the camera to change modes at higher lux values.

3. (Optional) Set the Transition Detect Time, determining the frequency at which the device checks for adequate light to transition to day mode or night mode.

IR Illumination

Select IR Illumination as Off or Auto.

Configuring Focus and Zoom Settings

Go to Imaging > Focus / Zoom to optimize the Field of View of your camera and maintain a clear image regardless of the scene or environment.

Using Auto Focus Mode

Set *Temperature Change Refocus* to automatically refocus the camera if the environmental temperature increases or decreases by 5°C (9°F) or more.

Set *Day/Night Switch Refocus* to automatically refocus the camera when switching between day and night mode. Select On if the camera's focal length is greater than ~25 mm or the night scene uses mostly IR lighting.

Initialize Lens: resets the lens elements to home position.

Auto Focus: automatically focus the camera on the subject in the center of the scene.

Using Manual Focus Mode

Manual focus is recommended when using analytics to avoid problems with scene recognition, which can cause suspended analytic performance or false alarms.

Using Zoom

The remote zoom functionality allows you to make changes to the field of view for your camera thru the WebUI. It is a convenient way to ensure that the scene's viewing angle is optimized, and the desired Field of View is set for your scene without having physically be at the camera's location.

Adjust the slider bar to increase/decrease the zoom position of the lens.

Adjusting White Balance

Go to **Imaging** > **White Balance** to adjust the white balance of your camera.

Auto Mode: Defines how the camera processes video images to render true colors in a scene. When this setting is on, the camera maintains automatic color balance for most lighting conditions, including outdoor scenes, scenes with changing lighting conditions, or in scenes with more than one type of light source.

Manual Mode:

Select **Basic** to adjust the Red and Blue value in the scene with an allowable value range of -100 to 100.

Select **White Patch** to calibrate the White Balance for a scene were the lighting does not change significantly.

1. Locate an area that should appear white. Ensure that it is being illuminated by the same light as the rest of the scene. If no white is present, any pure white object (such as white paper) can be temporarily added to the scene.
2. Then using the image on the left, click and drag a box within the white area. The color in the live preview image on the right will adjust. (please wait for a few seconds for it to refresh).
3. Repeat if necessary, to achieve desired results.

Select **Color Chart** to calibrate the White Balance against a Color Chart.

1. Place an X-Rite (ColorChecker(R) Classic 24 patch target) in the field of view of the camera illuminated by the same light as the rest of the scene such that it occupies at least 40% of the frame

(consider using the Zoom slider if the chart is too small).

2. For each corner of the chart select the appropriate color button; Dark Skin, Bluish Green, White, or Black. Then using the image on the left, draw a rectangle within the corresponding color square.

Using the Window Blanking Feature

Window Blanks, or privacy masks, will block sections of your camera's image from being viewed. Blanked areas persist in all video produced from the camera, whether viewing video directly through the camera's interface or from a higher-level recording device or system.

Note: Window-blanking regions will not scale proportionally with changes in zoom. Set the zoom level for the camera before defining window-blanking regions.

To create window blanks:

1. Go to **Imaging** > **Window Blanking**.
2. Select On to enable Window Blanking.
3. Click and drag the mouse across the video area that you want to blank. Select an existing blanking region to delete it, or edit its size and position. You can create up to 16 window blanks.
4. Select **Save**.

The Edit Window displays each blanking window you have set. To edit a blanking window:

1. Select a window in the *Edit Window* or in the *Preview Display* to move or resize the blanking window.
2. Select X to erase and close a blanking window.

Using the A/V Streams Menu

The A/V Streams menu provides access to *Video Preset Configurations*, *Video Configurations*, *Audio Configurations*, *RTP Settings*, and *Smart Compression* settings for your device's video and audio streams.

Selecting Video Preset Configurations

Go to A/V Streams >Video Presets for a set of fully-configured video configurations that offer a good balance of video performance to bandwidth. These presets may also be used as a starting point for a custom configuration. Select your desired Preset Configuration of High, Medium, or Low and select Save. Video preset configurations may vary depending on the camera model.

Note: Preset Configuration details are displayed in the user interface next to the desired profile , and may vary depending on the camera model.

Configuring a Custom Video Configuration

The *Video Configuration* page contains settings for customizing your camera's primary, secondary, and tertiary video streams. Although each stream can be configured independently, the settings for one stream can limit the options available to the other stream, depending on the processing demands of your stream settings.

1. Go to **A/V Streams** >**Video Configurations**.
2. Select the maximum frame rate—the maximum number of video frames contained per second. Higher values result in higher quality video with less flicker but consume more bandwidth.
3. Select the aspect ratio—the ratio of height to width of the video frame.
4. (Optional) Provide a user-friendly name, which is typically Primary, Secondary, or Tertiary, for your custom streams in the *Stream Name* box (2 to 64 alphanumeric characters).
5. Configure the enable setting, which provides the ability to turn any stream ON or OFF. Select Enable from the drop down menu to turn the stream on or Disable to turn it off.
6. Configure the remaining video stream settings listed in *Configuring Video Settings* to finalize your customization needs.
7. Select **Save**.

Configuring Video Settings

Compression Standards: Available compression standards depend upon the model of the camera that you are using.

- **H.265:** Designed to boost video streaming. A compression standard designed to substantially improve coding efficiency.
- **MJPEG:** Has the least impact on the camera's processor but requires the most bandwidth. This is similar to JPEG (not available on this camera), but uses RTP.
- **H.264:** The most processor-intensive compression standard but requires the least amount of bandwidth. Standard compression format for increased efficiency.

Resolution: The quality of the video stream, rendered in pixels for both width and height. Higher values result in greater video quality but consume more bandwidth.

Image Rate: The number of frames per second (fps) available for the video stream configuration. Available image rates depend upon the model of the camera that you are using.

Bit Rate: The quality of the video stream, rendered in kilobits per second. Higher values result in greater video quality but consume more bandwidth.

Note: When you change video stream configuration settings, the camera automatically adjusts the bit rate. Choosing a bit rate below the camera's automatic setting might reduce video quality and limit stream configuration options.

I-Frame Interval: Determines the number of partial frames that occur between intra-coded frames (I-frames) in your video stream. I-frames are complete images, used as a reference for change in the following video frames. Following an I-frame, the camera will capture and encode only video data in the scene differing from the I-frame until the next I-frame.

Note: This setting is only available for H.264 and H.265 video streams. Increasing the I-frame interval can improve video compression rates and reduce the size of video data; however, higher values are recommended only for highly-reliable networks.

Profile: Defines the subset of bit stream features in an H.264 or H.265 stream, which includes color reproduction and additional video compression. It is important you select a profile that is compatible with your recording device(s) to ensure that your camera's video stream can be decoded and viewed.

- **Main:** An intermediate profile with a moderate compression ratio. This profile is compatible with most recorders and uses fewer bits to compress video than the baseline profile, but more bits than the high profile. The main profile supports I-frames, P-frames, and B-frames.
- **High:** A complex profile with a high compression ration. This is the primary profile for high-definition television applications. The high profile supports I-frames, P-frames, and B-frames.

Quality of Service (QoS) for Different Services Code Point (DSCP): A mechanism for prioritizing network traffic. This setting is available only with H.264 and H.265 compression standards. Your network must be QoS-aware to take advantage of this setting. If you are unsure if your network is QoS-aware, contact your network administrator.

Endura Signing: Allows an Endura® system to authenticate recorded video streams. Endura signing is a technology designed to prevent the tampering of video and ensure video authenticity for use in legal proceedings. Only exported video is validated in the Pelco export player when the user selects the checkbox. Live View is not validated. This setting is available with H.264, H.265, and MPEG-4 compression standards.

Rate Control: Determines the bit rate and quality of each frame in the H.264 or H.265 video stream. Each rate control setting is a compromise between image quality and the resources required for video storage. The availability of rate control settings depend upon the model of the camera that you are using.

- **CBR:** The constand bit rate (CBR) streams video at fixed number of bits per second. CBR uses the full capacity of the bit rate setting for scenes with or without motion. Video is always streamed at the user bit rate setting.
- **CVBR:** The constrained variable bit rate (CVBR) provides high-quality video and long recording time of variable bit rate in response to motion, while not exceeding the user-defined maximum bit rate over a period of several GoPs.

Note: When you change video stream configuration settings, the camera automatically adjusts the bit rate. Choosing a bit rate below the camera's automatic setting might reduce video quality and limit stream configuration options.

Configuring Audio

Not all camera models are equipped with an internal audio device. If your camera does not support audio natively, you must connect an audio device to the accessory port to capture audio. You can only enable

audio through the primary video stream.

Audio is disabled by default, but you can enable and configure audio streams from the Audio Configuration page.

Audio and video might not be synchronized when viewing the primary stream through a Web browser. You might experience up to a 3-second delay in video when viewing the primary stream with audio enabled.

> **Note:** Improper use of audio/visual recording equipment may subject you to civil and criminal penalties. Applicable laws regarding the use of such capabilities vary between jurisdictions and may require, among other things, express written consent from the recorded subjects. You are solely responsible for ensuring strict compliance with such laws and for strict adherence to any/all rights of privacy and personality.

1. Go to **A/V Streams** > **Audio Configuration**.
2. Enable Audio.
3. Select your sample rate. The sample rate is the quality of the audio stream (measured in hertz per second).
4. Select your Audio Device.

   - **Native Line In:** Enables audio from a microphone connected to the audio-in connector.

     > **Note:** Only available for products with built-in audio support.

   - **Microphone:** Enables audio from the internal microphone.

     > **Note:** Only available for products with a built-in microphone.

5. Select the encoding method (PCMU, PCMA, or PCM16 Encoding).
6. Set the Input Level. Input sensitivity is measured on a scale from 0 to 100 (low to high).

   > **Note:** If the camera is installed in a noisy environment or the connected microphone has a built-in line amplifier, you should lower audio sensitivity.

7. Select **Save**.

Managing RTP Settings

The RTP Settings page provides access to advanced multicast and MTU (TCP/IP) settings.

Setting Static Multicast Addresses

A multicast stream sends video data to multiple users from the same transmission. Each multicast user connecting to the camera consumes no additional processing power.

You can set static multicast addresses and ports for all of your camera's multicast streams (primary, secondary, tertiary, audio).

Default, automatically-assigned multicast addresses are confined to the 239.x.x.x block in a scheme matching your IP address and network settings; you can determine the automatically-assigned multicast address(es) for your camera from the RTP page.

1. Go to **A/V Streams** > **RTP Settings**.
2. Enter static multicast addresses and ports for your streams as necessary.

3. Set the *Time to Live (TTL)* for each stream; this is the number of routers the stream can pass through before it expires.

4. Determine whether or not to *Always Multicast* this stream. This setting eliminates the need for a client to connect to the camera to initiate a stream; when enabled, the camera begins sending the multicast stream when it starts up, without requiring initiation from a client.

5. Select **Save**.

Setting the Maximum Transfer Unit Size (TCP/IP)

You can adjust the maximum transfer unit size to adjust to your network's constraints. Changing the MTU setting will require your camera to restart. This could take several minutes.

1. Go to **A/V Streams** > **RTP Settings**.

2. Set the *Max Transfer Unit* size.

3. Select **Save** or Save and Reboot Camera, depending on your camera.

Understanding Smart Compression

Smart Compression Technology lowers bandwidth and storage requirements while retaining image quality and critical information for forensic purposes. Benefits include: reduced storage capacity requirements and high resolution.

To work correctly, gathering bitrate statistics requires the date and time to be set correctly. If you have not set your time zone, you will receive an "Inaccurate Date and Time" message. Date and time can be set in General Settings.

Prior to establishing settings for Pelco Smart Compression, use A/V Streams to configure the video and audio streams for the camera. The Pelco Smart Compression window is organized with settings on the left side and a graph viewer on the right.

Configuring Smart Compression

Pelco Smart Compression Technology lowers bandwidth and storage requirements while retaining image quality and critical information for forensic purposes. Benefits include reduced storage capacity requirements and high resolution.

To work correctly, gathering bitrate statistics requires the date and time to be set correctly. If you have not set your time zone, you will receive an "Inaccurate Date and Time" message. Date and time can be set in General Settings.

Prior to establishing settings for Pelco Smart Compression, use A/V Streams to configure the video and audio streams for the camera.

1. Go to **A/V Streams** > **Smart Compression**.

2. Select Settings and Short-Term Graph.

3. Select the *Smart Compression Level*.

    - Off—no bitrate reduction
    - Low—no visible effect on video quality in most scenes
    - Medium—visible effect on video quality in some scenes
    - High—video degraded in many scenes

4. (Optional) Enable Dynamic GoP Length.

> **Note**: The option to establish the Dynamic GoP Length is enabled when compression levels are set to Low, Medium, or High.

5. (Optional) Set the maximum GoP length for your streams if you want to impose an upper limit on the dynamic GoP setting.

   By enabling a dynamic Group of Pictures (GoP), the number of I-frames are automatically reduced in scenes with minimal motion. Based on the complexity of scenes and the amount of motion occurring, such as in a storage room that has limited activity, up to 70% bandwidth savings can be achieved.

   For each video stream, you can enable Dynamic GoP Length as well as establish an Optional Maximum GoP Length. GoP length will change dynamically based on variable conditions that your camera might be monitoring.

   > **Note:** Dynamic or long GoP lengths may cause compatibility issues with some video management systems (VMS). Ensure your VMS supports dynamic GoP settings before enabling this setting.

6. Select **Save**.

Configuring Long-Term Rate Control

Set Long-Term Rate Control to ensure storage does not exceed a specific size.

1. Run the camera for multiple days which should represent multiple times the length of the observation period you will be using.
2. Select Long-Term Rate Control.
3. Select the *Video Stream* to which you will apply the settings.
4. Select the *Bitrate Units*: either total kbps or Gbytes/day.
5. In the *Long-Term Rate Controls* area:

   - Select **Enabled** to enable the Controls. You can Disable the Controls at any time.
   - Use the slider bar to select the *Average Bitrate Limit*, type in a value, or select **Copy to Slider** in the *Recommendations* area.
   - Use the slider bar to select the *Observation Period in Days*, or type in a value.

6. Select Save.
7. To view the *Long-Term Graph* for either stream:

   - Select the *Primary Video Stream* or *Secondary Video Stream*.
   - Select the *Bitrate Units* in kbps or Gbytes/day.
   - In the *Long-Term Graph* data viewer,select **Update**. The graph helps you understand how much storage the camera will use.
   - If appropriate, select **Delete Long-Term Data for** [Secondary or Primary, whichever is selected], and then select **OK** in the confirmation dialog box.

Using the Events Menu

The **Events menu** contains settings for camera events and analytics, and includes **Source**, **Handlers**, **Analytic Configuration**, and **Event Stream** pages.

An event is a user-defined occurrence, consisting of a source and a handler. A source defines the trigger for an event; a handler defines the action your camera will take when the event source occurs. When configuring a source, you can link the source to multiple handlers, providing multiple outcomes for the event. When configuring a Handler, you can link the handler to multiple sources, providing a single outcome for multiple events.

Analytics are specialized event sources that are triggered by the user-defined behaviors or scenarios occurring within your camera's field of view. Analytics are compatible with VideoXpert™ or third-party systems that support events using ONVIF or Pelco's API. The analytic behaviors available for your camera are dependent on your model and firmware version.

Configuring Sources

An event source defines the trigger for an event, something that must occur before your camera takes action (defined by a handler). Event Sources that can be configured include Alarm, Analytics, Timer, System, and Network Loss events.

Configuring an Alarm Event Source

An alarm source triggers an event upon a signal from external signaling devices, such as a door contact or a motion detector.

1. Go to **Events** > **Sources**.
2. select New or select the source you want to edit.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.
4. Select Alarm from the source *Type* .
5. Set the dwell time for the alarm between 1 and 25 seconds. Dwell time is the amount of time that the source will remain active during an alarm event.
6. Select the polarity of your alarm input (normally open or normally closed).
7. Select either True or False from the *Supervised* drop-down menu.
8. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the Events menu Handlers page.
9. Select **Save**.

Configuring an Analytic Event Source

An analytic event source triggers an event when a behavior defined by a video analytic occurs.

1. Go to **Events** > **Sources**.
2. Select New, or select the existing source you want to edit.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.
4. Select Analytics from the source *Type* .
5. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the **Events** menu *Handlers* page.
6. Select **Save**.

Configuring a Timer Event Source

A timer event source triggers an event at specified intervals of time.

1. Go to **Events** > **Sources**.

2. Select New, or select the source you want to edit.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select *Timer* from the source *Type* .

5. Configure the frequency of the event, including the units of time available, in the pull-down menu.

6. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the **Events** menu Handlers page.

7. Select **Save**.

Configuring a System Event Source

A system source triggers an event when your camera boots.

1. Go to **Events** > **Sources**.

2. Select New Source, or select the source you want to edit.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select *System* from the source *Type* .

5. (Optional) If available, select the handler(s) that you want to associate with this source. Handlers are configured from the **Events** menu *Handlers* page.

6. Select **Save**.

Configuring a Network Loss Event Source

A network loss event source triggers an event if the connection to a network is lost.

1. Go to **Events** > **Sources**.

2. Select New, or select the source you want to edit.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select *Network Loss* from the source *Type* .

5. Enter the IPv4 IP address that will be monitored for ping requests.

6. Establish the frequency, in minutes, which the network device is contacted.

7. Select **Save**.

Deleting an Event Source

1. Go to **Events** > **Sources**.

2. Select the source that you want to delete.

3. Select Delete to remove the event source.

Configuring Handlers

Event handlers are the actions that your camera takes when an event source occurs. Event **Handlers** that can be configured include *Send Email*, *Upload JPEG to FTP Server*, *Write JPEG to SD Card*, *Open/Close Relay*, *Display Overlay*, *Play Audio*, *Write Recording to SD Card*, and *Upload Recording to FTP Server* when an event occurs. The availability of handlers might change based on your camera model.

Configuring an Event Handler: Send Email

The Send Email event handler sends an email from your camera when a source event is triggered.

> **Note:** You must have provided your camera with the address of an SMTP mail server on the **System** > *General Settings* page for your camera to send email notification for events.

1. Go to **Events** > **Handlers**.

2. Select **New** or select the handler you want to reconfigure.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the *Name* box.

4. Select the *Send Email* handler Type.

5. Provide the necessary information for your email in the *To*, *From*, *Subject*, and *Message* boxes.

6. (Optional) Select the *JPEG Snapshot* box if you want to send a JPEG snapshot as an attachment to the email.

7. (Optional) Select the *Attach Raw Event Data* box if you want the email to include extra data about the event. For example, select this box if the event is triggered by an alarm and you want to receive data about the state, time, or type of alarm.

8. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.

9. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page. Sources are configured from the **Events** menu *Sources* page.

10. Select **Save**.

Configuring an Event Handler: Upload JPEG to FTP Server

This event handler captures and uploads a JPEG to an FTP server when an event source is triggered. JPEG files are named according to the date and time at which they are recorded; although, you can determine the order of factors in the date-and-time filename.

1. Go to **Events** > **Handlers**.

2. Select **New** or select the handler you want to reconfigure.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select the *Upload JPEG to FTP Server* handler Type.

5. Provide the address of your FTP server in the *Server* box.

6. Provide the credentials the camera will use to authenticate with the FTP server; the *User Name* must be between 1 and 32 alphanumeric characters, and the *Password* must be between 4 and 16 alphanumeric characters.

7. Provide the path in which to store JPEG files on your FTP server in the *Base Path* box.

8. Select the *File Name* for your JPEG snapshots.

9. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.

10. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.

11. Select **Save**.

Configuring an Event Handler: Write JPEG to SD Card

This event handler captures and uploads a JPEG to an SD Card when an event source is triggered. JPEG files are named according to the date and time at which they are recorded; although, you can determine the order of factors in the date-and-time filename.

1. Go to **Events** > **Handlers**.
2. Select **New** or select the handler you want to reconfigure.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.
4. Select the *Upload JPEG to SD Card* handler Type.
5. Select the *File Name* for your JPEG snapshots.
6. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
7. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.
8. Select **Save**.

Configuring an Event Handler: Open/Close Relay

The Open/Close handler opens or closes a relay when a source event occurs.

1. Go to **Events** > **Handlers**.
2. Select *New* or select the handler you want to reconfigure.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event handler in the *Name* box.
4. Select the *Open/Close Relay* handler type.
5. Select the individual relay you want to trigger when an event occurs from the *Relay* handler Type.
6. Select the *Relay Mode*: Pulse or Trigger.
7. Use the *On Time* controls to set the amount of time the relay will remain open, up to 200 seconds.
8. Use the *Off Time* controls to set the amount of time the relay will remain closed, up to 200 seconds.
9. Set the *Pulse Count* for the relay. The pulse count is the number of relay pulses (number of on and off cycles).
10. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.
11. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.
12. Select **Save**.

Configuring an Event Handler: Display Overlay

This event handler displays an OSDi of the source name when any connected source is triggered.

Note: Overlay configuration settings are available on the OSDi page.

1. Go to **Events** > **Handlers**.
2. Select **New** or select the handler you want to reconfigure.
3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select the *Display Overlay* handler Type.

5. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.

6. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.

7. Select **Save**.

Configuring an Event Handler: Play Audio

1. Go to **Events** > **Handlers**.

2. Select **New** or select the handler you want to reconfigure.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select the *Play Audio* handler Type.

5. select Browse and select a valid .WAV file to be played when the event occurs.

6. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.

7. (Optional) If available, select the source(s) that you want to trigger this event handler.Sources are configured from the **Events** menu *Sources* page.

8. Select **Save**.

Configuring an Event Handler: Write Recording to SD Card

This event handler captures and uploads a video to an SD Card when an event source is triggered. Video files are named according to the date and time at which they are recorded; although, you can determine the order of factors in the date-and-time filename.

Note: These video clips can be downloaded from Snapshot Viewer page.

1. Go to **Events** > **Handlers**.

2. Select **New** or select the handler you want to reconfigure.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select the *Write Recording to SD Card* handler Type.

5. Enter *Pre-Event Buffer* duration, *Post-Event Buffer* duration, and *Size Limit* for the Recording to be written for the SD Card.

6. Select the *File Name* for your video recording.

7. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.

8. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.

9. Select **Save**.

Configuring an Event Handler: Upload Recording to FTP Server

This event handler captures and uploads a recording to an FTP server when an event source is triggered. Recording files are named according to the date and time at which they are recorded; although, you can

determine the order of factors in the date-and-time filename.

1. Go to **Events** > **Handlers**.

2. Select **New** or select the handler you want to reconfigure.

3. Provide a name, between 2 and 23 alphanumeric characters, for the event source in the *Name* box.

4. Select the *Upload Recording to FTP Server* handler Type.

5. Provide the address of your FTP server in the *Server* box.

6. Provide the credentials the camera will use to authenticate with the FTP server; the *User Name* must be between 1 and 32 alphanumeric characters, and the *Password* must be between 4 and 16 alphanumeric characters.

7. Provide the path in which to store video files on your FTP server in the *Base Path* box.

8. Select the *File Name* for your video recording.

9. (Optional) Set time filters to determine the days and times during which the handler will be active. If you do not select any filters, the handler will remain active at all times. All time values must be formatted in 24-hour notation.

10. (Optional) If available, select the source(s) that you want to trigger this event handler. Sources are configured from the **Events** menu *Sources* page.

11. Select **Save**.

Deleting an Event Handler

1. Go to **Events** > **Handlers**.

2. Select the handler that you want to delete.

3. Select Delete.

Analytic Configuration

The Analytic Configuration page allows you to analyze the camera's field of view to detect and trigger events or alarms when specific activity occurs.

Multiple analytic behaviors can be configured (Go to **Events** > **Analytic Configuration**). However the complexity of active behaviors and zones per behavior may increase the processing load on your camera. Once configured, your camera will monitor your defined zones for activity violating the parameters of the behavior. You can view analytic events through your camera's event stream (Go to **Events** > **Event Streams**). However, analytic alarms are only transmitted through Pelco's API, and are therefore only available with compatible VMS systems or through direct integration.

You can configure multiple analytic behaviors. Each analytic behavior has its own settings, and many analytic behaviors also require you to configure zones that the camera will monitor for activity. The analytic behaviors available to your camera are dependent on your model and firmware version.

Configuring Basic Analytics

Basic contains simple motion detection and camera sabotage capabilities. Simple analytics allow the camera to record or send an alarm when there is motion detected in a selected zone or within the entire scene. A camera sabotage alarm is triggered if the lens is obstructed or when the camera is repositioned.

Configuring Motion Detection

1. Check Enabled.

2. Enter an *Event logging (profile) name*.

3. Establish an alarm priority by selecting *Alarm Severity* of Minor, Normal, Major, or Critical.

4. Choose a *Sensitivity* level of Low, Medium, or High to establish what amount of change in motion within the camera's field view that triggers a handler behavior.

5. Use the slider bar or text input box to set the *Threshold %* in how much motion needs to occur in order to trigger the alarm.

Configuring Edit Mask Mode

Motion Detection requires a mask to be drawn to indicate where the camera should look for motion. Use the Edit Mask controls to setup the mask.

1. Select the *Edit Mask* mode option to Draw or Erase sections of the mask.

2. Select a Rectangle or Paintbrush (line) drawing *Tool*.

3. Use the mouse cursor to Draw the mask or Erase sections of the mask.

    - Revert back to a previous state by selecting Undo.
    - Selecting Redo will reverse the Undo action.

4. Select Save.

Configuring Sabotage Detection

1. Check Enabled.

2. Establish the sensitivity to motion that will trigger a handler behavior by choosing from Low, Medium, or High.

3. Enter an *Event logging (profile) name*.

4. Establish an alarm priority by selecting *Alarm Severity* of Minor, Normal, Major, or Critical.

5. Select Save.

Configuring Enhanced Analytics

To configure the scene settings:

1. Select a *Scene Type* of indoor or outdoor.

2. Choose a Still or Noisy background based on the expected amount of background movement in the scene. A stable background with few moving objects should be set to Still. A busy background, with many moving objects should be set to Noisy.

3. Use the *Fine tuning* option to define zone violation sensitivity. Available settings include Conservative, Normal, or Aggressive. The Conservative setting is the least sensitive setting, reducing the number of false alarms, but might prevent the camera from detecting zone violations. The Aggressive setting is the most sensitive setting, detecting all suspect violations, but might cause the camera to trigger more false alarms.

4. Establish the *Sensitivity* or relative amount of motion, between 1 (low) and 10 (high), that will trigger a behavior. The higher the setting, the greater the chance for false alarms; lower settings will reduce the chance of false alarms but might result in missed violations.

5. *Consistency* helps trigger a behavior when an object moves into the frame from a consistent direction. The sensitivity detection can be set from 0 (low) to 10 (high).

6. The *Calibration* function will show as *Not Completed* or *Completed*. If calibration is Not Completed, select Calibrate Scene. This will open a separate *Calibrate Scene* page.

7. Select Set height. This will bring up a blue square. Place the blue square over an object at a distance and set the *Real-world height* of the object in either feet or meters.

8. Select **Set width**. Two yellow lines appear. Measure the width of a far object using the line denoted by "Width of a far object" and the width of a near object using the line denoted by "Width of near object".

9. Select **Return to Main**.

The Calibration shows as *Completed*.

Applying Select Behaviors

The settings available are dependent on the analytic behavior that you are configuring.

- **Alarm at** (Object Counting): Determines the number of objects entered into a zone that will trigger an alarm.

- **Alarm at** (Dwell Time): Defines the amount of time that an alarm will remain active when an alarm-triggering object exits the field of view or the zone.

- **Alarm severity**: Defines the severity of alarms triggered. Alarm severity helps you and other users prioritize alarms.

- **Delay before alarm**: Defines the amount of time an object must remain in a zone before triggering an alarm. For the Camera Sabotage behavior, this defines the delay between a scene violation and the trigger of an alarm.

- **Direction**: Determines the direction of motion a zone should track. Events will only be triggered when your camera detects motion in the specified direction.

- **Edit Zones**: Some analytic behaviors require you to configure zones, otherwise known as Edit Zones. A zone is a defined boundary that your camera monitors for an analytic behavior. Zones defined by polygons, trigger analytics based on motion within the zone. Zones defined by lines trigger analytic events when an object within the scene crosses the line.

- **Enable Alarm**: Enables a zone alarm. Analytic events for the zone will appear in the event stream when viewing live video, and trigger event handlers if the Analytic Event source is enabled.

- **Sensitivity**: Overrides the global Profile sensitivity setting for the selected behavior, defining the relative amount of motion, between 1 (low) and 10 (high) that will trigger an event or alarm. Sensitivity is an advanced option for some behaviors.

- **Zone Sensitivity**: Defines the relative amount of motion within the selected zone that will trigger an event or alarm. Zone sensitivity can be set at a lower or higher setting than the overall sensitivity setting for the rest of the scene or the Profile sensitivity setting for the selected behavior.

- **Object speed**: Adjusts for speed if the scene is configured to track moving objects at a slower or faster rate than actual speed.

Using Drawing Tools

When configuring a zone-based analytic behavior, you can draw zones by selecting one of the zone-drawing tools and then selecting within the scene to draw the zone. The availability of zone drawing tools is dependent on the analytic behavior you are configuring. Drawing tools include:

- *Rectangle* Tracks objects in a defined rectangular zone and triggers an alarm if the objects move in the same direction as defined.

- *Polygon*: Tracks objects in a defined zone and triggers an alarm if the objects move in the same direction as defined.

- *Line*: Tracks objects that cross a line and triggers an alarm if the objects move in the same direction as defined.

- *Rectangular Excluded Zone*: Ignores objects inside a defined rectangular zone.

- *Polygon Excluded Zone*: Ignores objects inside a defined zone.

- *Set Object Size filters*: Allows the user to set the minimum and maximum object size for a zone. Objects that fall outside these limits will not be detected.

Using Select Behaviors

The following section describes the function of each Select Behavior and the ideal situation in which to use the behavior.

Abandoned Object

The Abandoned Object behavior detects objects placed within a defined zone and triggers an alarm if objects remain in the zone longer than the user-defined time allows.

Ideal Scene Setup for Abandoned Object Analytics

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activities.

The ideal scene for the Abandoned Object behavior contains light traffic where people or objects within the field of view are continually moving, there are minimal obstructions, and the background is clean. If heavy traffic or a busy background is unavoidable, place monitoring zones in relatively stable areas.

Avoid crowded scenes where people or objects remain in one place for long periods of time.

Using Adaptive Motion

The Adaptive Motion behavior detects and tracks objects that enter a scene and then triggers an alarm when the objects enter a user-defined zone.

The Adaptive Motion behavior is designed to work indoors and outdoors to track a few moving objects in uncrowded fields of view. The behavior learns the background scene over time and adjusts to changing conditions like snow, fog, wind, and rain.

Ideal Scene Setup for Adaptive Motion

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity.

The ideal scene for Adaptive Motion behavior is one with light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place zones in a relatively stable area.

Avoid crowded scenes where people move in all directions or stand in place for long periods of time.

> **Note:** Objects that are very small might not be classified as the correct object type. This could result in false alarms or alarms not being triggered. If objects appear too small in the scene, zoom in on the particular zone of interest or move the camera closer to the zone of interest to increase the relative size of the objects in the scene.

Directional Motion

The Directional Motion behavior generates an alarm in a high traffic area when a person or object moves in a specified direction. Examples of typical installations for this behavior include airports, entrances and exits, and vehicle traffic through tunnels.

- In an airport installation, cameras observe passengers boarding a plane in a terminal. If a person moves in the opposite direction of the normal flow of traffic, an alarm triggers.
- In a tunnel installation, an operator wants to observe traffic flow. If a car enters a tunnel through an exit, an alarm alerts the operator to activate the traffic signals to stop all traffic in the tunnel.

- In an entrance or exit installation, a camera is pointed at an exit door. If a person tries to enter through the exit door, an alarm triggers.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity. The width of the object you want to detect should be at least one-tenth of the total width of the scene. To achieve increased accuracy in a crowded scene, set the width of the object to one-sixth of the total width of the scene.

The ideal scene selection for the Directional Motion behavior contains light traffic with all people and objects moving in the same direction, minimal obstructions, and a clean background; however, the behavior can be used in settings that do not meet all of these requirements. If heavy traffic or a busy background is unavoidable, place zones in a relatively stable area.

Avoid crowded scenes in which people move in all directions or stand in one place for long periods of time.

Using Loitering Detection

The Loitering Detection behavior identifies when people or vehicles remain in a defined zone longer than the user-defined time allows. This behavior is effective in real-time notification of suspicious behavior around ATMs, stairwells, and school grounds.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activity.

The ideal scene for Loitering Detection behavior is one with light traffic and a clean background. If heavy traffic or a busy background is unavoidable, place the user-defined zone in a relatively stable area.

Avoid crowded scenes where people move in all directions or stand in one place for long periods of time.

Using Object Counting

The Object Counting behavior counts the number of objects that enter a user-defined zone. This behavior can be used to count people at a store entrance/exit or inside a store where the traffic is light. It might also be used to monitor vehicle traffic on highways, local streets and roads, parking lots, and garages.

The ideal scene for the Object Counting behavior contains light traffic, minimal obstructions, and a clean background. If heavy traffic or a busy background is unavoidable, place zones (polygon or line) in relatively stable areas.

A one-directional motion scene (for example, a vertical hallway) is preferable. Avoid crowded scenes in which people or objects move in all directions or remain in place for long periods of time.

Using Object Removal

The Object Removal analytic behavior triggers an alarm if an object is removed from a user-defined zone. It is ideal for detecting the removal of high-value objects, such as a painting from a wall or a statue from a pedestal.

Install the camera in a high position looking down on the scene. The monitored object should occupy a quarter of the camera scene, and the field of view should be as wide as possible.

The ideal scene selection for the Object Removal behavior is a clean background with stable lighting and minimal obstruction.

Using Stopped Vehicle

The Stopped Vehicle behavior detects vehicles stopped near a sensitive area, and sets an alarm if the vehicle is present for longer than a user-specified period of time. This behavior is ideal for parking enforcement, identifying suspicious parking, finding traffic lane breakdowns, and spotting vehicles waiting at gates.

Install the camera in a ceiling or against a wall with the lens pointing at a slight downward angle, above regular motion activities.

The ideal scene for the Stopped Vehicle analytic behavior contains light traffic in which vehicles are continually moving, there are minimal scene obstructions, and the background is clean. If heavy traffic or a busy background is unavoidable, place monitoring zones relatively stable areas.

Avoid crowded scenes where people or objects remain in place for long periods of time.

Event Stream

The *Event Stream* displays a list of alerts triggered by an active analytic behavior. The alert includes a screen capture, the profile that was triggered, and the zone in which the event was detected.

Contacting Pelco for Troubleshooting

For further instructions, contact Pelco Product Support at 1-800-289-9100 (USA and Canada) or +1-559-292-1981 (international) for assistance. Have the serial number available when calling.

Do not try to repair the unit yourself. Leave maintenance and repairs to qualified technical personnel only.